SECTION 102

VALVES, HYDRANTS, AND APPURTENANCES

102-1 GENERAL

102-1.01 Description. - This work consists of furnishing and installing valves, hydrants, and appurtenances. Related work is specified in the following sections:

Section 19, "Earthwork"
Section 101, "Pipe and Fittings"
Section 103, "Miscellaneous Equipment"
Section 104, "Disinfecting and Pressure Testing"

102-1.02 Submittals. - Within 60 days after the date of Notice to Proceed, the Contractor shall submit:

1. Working drawings and manufacturer's data showing unit assembly, operators, component parts, dimensions, and net weight.
2. Details of end connections.
3. Manufacturer's installation, and operation and maintenance instructions.
4. Test records.

102-1.03 Certificates of Compliance. - The manufacturer shall establish the necessary quality control and inspection practice to assure compliance with these specifications. The manufacturer shall furnish a Certificate of Compliance as specified in Section 6-1.07, "Certificates of Compliance" of the General Conditions, that all the required tests have been made and the results comply with the requirements of these specifications.

102-1.04 Interruption of Service. - Service in existing mains can be interrupted only upon authorization of the Engineer who will specify time and duration of the outage. The Contractor shall notify all affected users in writing at least 24 hours in advance of service interruption, using printed forms provided by the Engineer. The Contractor shall also request the Engineer to notify the Municipal Water System personnel at least 48 hours in advance of scheduled valve closing for service interruption. Manipulation of existing valves shall only be done by or under the direction of Municipal Water System personnel.

102-1.05 Marking. - Valves and hydrants shall be marked in accordance with the requirements of the appropriate specified standard.

102-2 VALVES

102-2.01 Butterfly Valves. - Butterfly valves shall conform to the requirements of AWWA Standard C504, as specified herein and in the special provisions. The following will be specified in the special provisions or on the

plans: Class, if no class is specified, Class 150B valves shall be furnished; valve ends, operator requirements, and other special requirements.

102-2.01A Body. - Valve body shall be of ASTM A 126 Class B cast or ductile iron.

Valve designs utilizing continuous rubber lining on the internal body surfaces and extending over the flanges or a disk which sits at an angle to the axis of the pipe shall not be furnished.

102-2.01B Seats. - Seats for potable water service shall be of molded new natural rubber or approved synthetic rubber.

Seat shall be mounted on disc or in body.

Seats mounted on disc shall be mechanically fastened to the disc with stainless steel hex head screws. Rubber seat shall be reinforced with stainless steel retaining ring. Seats vulcanized or bonded to the disc are not acceptable.

Seats mounted on body shall be clamped or mechanically secured with stainless steel fasteners or bonded to the body by an approved process.

102-2.01C Mating Surfaces. - Mating surfaces for valves with seat on disc shall be Type 304 or 316 stainless steel. Mating surface shall be mechanically retained in body and sealed with an O-ring.

Mating surfaces for valves with the seat in the body shall be Type 304 or 316 stainless steel or plasma applied nickel-chromium material containing 80 percent nickel, 20 percent chrome.

Plated or sprayed-on mating surface material is not acceptable.

102-2.01D Discs. - If seat is on the disc, the disc shall be of ASTM A 126 Class B cast or ductile iron. If seat is in the body, the disc shall be of ASTM A 126 Class B cast iron, ductile iron, or Type 304 or 316 stainless steel. Stainless steel edge on cast or ductile-iron discs shall be secured with stainless steel threaded fasteners, heat shrunk on disc, a welded-on overlay, or a plasma applied nickel-chrome material.

102-2.01E Shafts. - Shaft shall be of Type 304 or 316 stainless steel. Shaft shall be either one piece extending completely through disc or stub shafts inserted into valve disc stubs.

Shaft seal shall be of the split-V type or O-ring type. Seal shall be replaceable without disassembly of valve.

102-2.01F Actuators. - Each valve shall have a position indicator.

Actuators shall be capable of valve operation at rated pressure with a pull not exceeding 80 pounds on actuator. Operator shall be self-locking.

102-2.01G Dimensions and Tolerances. - Butterfly valves and parts shall conform to the dimensions and tolerances as specified in AWWA Standard C504 and when assembled, valves shall be well fitted and smooth operating.

102-2.01H Quality Requirements. - Butterfly valve parts shall be tested for the physical and chemical properties as specified in AWWA Standard C504. After manufacture, each butterfly valve shall be subjected to operation and hydrostatic tests as required by AWWA Standard C504.

102-2.02 Resilient Seated Gate Valves. - Gate valves shall conform to the requirements of AWWA Standard C509, as specified herein and in the special provisions. The following will be specified in the special provisions or on the plans: type of valve ends, and type of stem seal.

The intended position of the valves is approximately level with the stem positioned vertical. The operating wrench nut shall be 2 inches square with direction of opening, counterclockwise.

The valve main connection fittings shall be compatible with the type of pipe to which the valve will be attached.

102-2.02A Disc Wedging Mechanism, Valves 10-Inch and Larger. - For gate valves 10 inches and larger, the operating mechanisms of the parallel bronze discs shall be designed so that the seating pressure is applied to the discs equally at 4 separate contact points near the outer edge of each disc. The discs and wedging mechanism shall be held together as a unit. The side spreaders of the wedging mechanism shall be self adjusting to act as equalizers between the top equally to the 4 contact points. In closing the valve, the discs shall move freely to a position opposite the port openings of the body before engaging the side spreaders against wedges cast integrally with each disc. In opening the valve, the first movement of the stem shall lift the top wedge nut directly away from the side spreaders to relieve the wedging pressure before the discs can begin to rise.

102-2.02B Disc Wedging Mechanism, Valves 8-Inch and Smaller. - The disc wedging mechanism for gate valves 8 inches and smaller shall be as indicated above or may be of the bottom wedging type with 2 point floating wedge contacts.

102-2.02C Dimensions and Tolerances. - Gate valve parts shall conform to the dimensions and tolerances as specified in AWWA Standard C500 and when assembled, valves shall be well fitted and smooth operating.

102-2.02D Quality Requirements. - Gate valve parts shall conform to and shall be tested for the physical and chemical properties as specified in AWWA Standard C500. After manufacture, each gate valve shall be subjected to operation and hydrostatic tests as required by AWWA Standard C500.

102-2.03 Air Relief Valves. - Air relief valves shall have one-inch inlet and outlet connections and 3/8-inch orifice. Air relief valves shall be constructed of the following materials: body and cover, ASTM A48 Class 30 cast iron; float and leverage mechanism, ASTM A 240 or A 276 stainless steel. The orifice and seat shall be stainless steel against Buna-N or Viton. All other valve internals shall be stainless steel or bronze.

102-2.04 Combination Air Relief and Vacuum Valves. - Combination air relief and vacuum valves with flanged inlet and outlet connections as shown on the plans. High pressure air release valve shall be a one-inch inlet and outlet and 3/8-inch orifice. Vacuum valve shall be constructed of the following materials: body and cover, ASTM A48 Class 30 cast iron; float, ASTM A240 stainless steel; seat, Buna-N. The air relief valve shall be constructed as specified in Section 102-2.03, above.

102-2.05 Tapping Sleeves and Valves. - Tapping sleeves shall be split sleeve, fabricated of steel and fusion epoxy coated. Tapping valves shall conform to the requirements for gate valves as specified in Section 102-2.02.

102-3 HYDRANTS

102-3.01 Fire Hydrants. - Fire hydrants shall be obtained from the City of San Jose Fire Department. The Contractor shall pay the City Department of Public Works for each hydrant at the price current as of the date of the Notice to Contractors. Each bidder shall obtain the current price from the Department prior to submitting the bid, if fire hydrants are part of the work under this contract.

102-4 INSTALLATION

102-4.01 General. - All debris, dirt, and other foreign matter shall be cleaned from pipes and mating surfaces before valves and hydrants are installed.

Valves and hydrants shall be erected and supported in their proper positions such that they are free from distortion until completely installed and blocked. All debris and other foreign matter shall be cleared from openings, seats and other parts. Operating mechanisms shall be tested and adjusted for proper function. Bolts and nuts shall be checked and tightened, if necessary.

Items shall be set plumb and in line and shall be shimmed and grouted in place as required to complete the work.

Valves shall have extension stems such that the length of the operating wrench will not exceed 6 feet.

102-4.02 Valves. - Valves shall be installed at the locations shown on the plans in accordance with manufacturer's recommended practice. Valves shall be set in a vertical position. Temporary blocking will be allowed to support valve or fitting until permanent anchor or thrust block is installed.

102-4.02A Valve Boxes. - A valve box shall be provided for valves as indicated on the plans. Valve boxes shall be firmly supported and shall be centered and plumb over the wrench nut of the gate valve, the box cover shall be flush with the surface of the finished pavement.

102-4.03 Fire Hydrants. - Fire hydrants shall be installed at the locations as shown on the plans. When placed behind the curb, the hydrant barrel shall be set 6 feet behind face of curb with hose nozzles parallel with the curb, and pumper nozzle facing the curb. The nozzles of hydrants set at locations without curbs shall be oriented as directed by the Engineer. Each hydrant shall stand plumb with the flange of the bury located 2-1/2 inches to 4 inches above the top of curb.

Each hydrant shall be connected to the main with a 6 inch ductile-iron branch controlled by an independent 6 inch gate valve. A thrust block of 3 square feet of bearing minimum shall be provided at the tee fitting (bowl) of each hydrant.

102-4.04 Air Relief Valves. - Air relief valves shall be installed in accordance with the details shown on the plans. In addition to the locations shown on the plans, air relief valves shall be installed at such locations, as determined by the Engineer, whenever any high point occurs in the line caused by a vertical change in grade of the main.

102-5 MEASUREMENT AND PAYMENT

102-5.01 Measurement. - Valves and hydrants will be measured as units for each type and size from actual count as installed in the work.

102-5.02 Payment. - Valves and hydrants, measured as specified above, will be paid for at the contract unit price each.

The above prices and payments shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in furnishing and installing the valves and hydrants, including valve vaults and boxes, thrust and anchor blocks, connecting to pipes, testing, flushing, cleaning, disinfecting, complete in place, as shown on the plans, and as specified in these specifications and the special provisions, and as directed by the Engineer.